Editor’s Note:

**Educational value-differentiation: new technology integration**

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**Abstract**

The focus of this article is an overview of educational value differentiation correlated with technology advancements. 21st Century educational pedagogy is multidimensional with new opportunities and challenges for a learner- centered teaching philosophy. Ubiquitous learning integrated with emerging online and mobile technologies provides opportunities for effective new adult learner education. An analysis is given of education technology stages, from 1920 to post 2015, mapped to education value differentiation. A new chronology model is proposed: the 10-Stage Educational Value-Differentiation Technology Chronology (ETVC) Model©2015 Perlman  Introduced in the 10th stage is a new concept for post 2015 era educational-value paradigms: the Flexible Critical-Thinking Concept©2015 Perlman This information may be useful to course-developers in understanding how to develop pedagogies for 22nd Century education. In turn, adult learners may benefit from being prepared for emergent technologies and industry challenges and opportunities.

**Keywords:** online learning, technology, distance learning, mobile learning, educational value differentiation mapping, adult learner engagement, learner-centered teaching philosophy, 10 Stage ETVC Model, Flexible Critical-Thinking Concept

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**Introduction**

Distance learning began with the initiation of correspondence education in the 1770s (Harting & Erthal, 2005). Correspondence education was made possible with the launch of regular postal service to the public, i.e.“new technology”. Distance learning has continued to evolve in conjunction with ongoing emergence of new technologies (Banas & Emory, 1998). With each stage of technology platforms, new delivery-techniques add learning value for students. Use of educational value-differentiation, enabled by technology, is crucial to effective learning. Teaching does not remain static (Saavedra & Opfer, 2012). To keep contemporary, adult learning pedagogy needs continual changes to be in sync with new technologies. Accordingly, understanding of multidimensional educational-value differentiations is foundational to understanding mobile (i.e. distance) learning.

The article begins with a discussion of mobile learning and educational value pedagogy. Next, a time-line synopsis of technology mapped to educational value-added from 1920 through post 2015 is analyzed. A new chronology model is proposed: the 10-Stage Educational Value-Differentiation Technology Chronology (ETVC) Model©2015 Perlman  Within the 10-Stage ETVC Model©, a new concept, the Flexible Critical-Thinking Concept©2015 Perlman is introduced to describe the educational-value differentiation for post 2015 era educational-value paradigms. Details of the model components are presented in Table 1. Concluding the article are summary reflections on the connections of educational-value differentiation, technology integration, and student learning experience in the post 2015 era. Recommendations for research on effective post 2015 ubiquitous learning technologies are given.

Table 1

10-Stage Education-Technology Value Chronology (ETVC) Model©2015 Perlman

An Overview of Educational Technology: 1920 to post 2015 Educational Value Differentiation

| **Education Technology Stage** | **Technology Stage Timespan** |  | **Adult Learner Engagement Focus** | **Educational Value Differentiation** | **Learning Manager** |
| --- | --- | --- | --- | --- | --- |
| 1. Visual-Media Stage | 1920-1949(Hashim & Gapor, 2010) | Visual | Visual Instruction Using Static Media | Pictures, Slides, Flash Cards, Models, Charts | Professor |
| 2. Multi-Media Stage | 1950-1959(Hashim & Gapor, 2010) | Audio Visual | Media Using Sound Recording, Radio Broadcasting, Motion Film with Sound | Instructional Television, Distance Learning Access To Remote Areas  | Professor |
|  |  |  |  |  |  |
| 3. IT Process Stage | 1960-1979 (Hashim & Gapor, 2010) | Information Technology Systems, Internet beginning  | Process Focus: Problem Identification, Analysis, Solution Development  | Problem Solving Utilizing Information Technology Software Systems | Professor and Learner |
|  |  |  |  |  |  |
| 4.ICTD Application Stage | 1980-1989 (Internet Society, 2015) | Internet widespread use; Information and Communication Technology (ICT) Development | Application Focus: instructional technology, including personal computer, software applications | Behavioral Learning Theory Application To Develop Cognitive Learning Theory Instructional Design | Professor and Learner |
|  |  |  |  |  |  |
| 5. ICTD Integration Stage | 1990-1994(Seels & Richey,1994) | Internet Information and Communication Technology (ICT) | Integration Focus: Student Interaction with course content is integrated within course. | Technological Communication Theory educational applications in five ICT areas: design, development, utilization, management and evaluation | Professor with increased flexibility in course aids controlled by the Learner |
|  |  |  |  |  |  |
| 6. EPSS Stage  | 1995-1999(Driscoll, 2000; Lee, 2005;Partlow & Gibbs, 2003;Reise, 2001) | Electronic Performance Support System (EPSS) instructional design software and hardware | Performance Focus: essential work-related information; a series of work activities | Just-In Time learningConstructionist Learning Theory | Professor with increased time flexibility for end goals by the Learner |
|  |  |  |  |  |  |
| 7. Knowledge Systems Stage | 2000- 2003Gal & Nachmias, 2011; Roberts & Naqvi, 2010; Rowley, 2000 | Knowledge Management Systems  | Learn by doing.  | Student enabled real-world learning environments  | Professor with increased assignment activity responsibility by learner |
|  |  |  |  |  |  |
| 8. Instructional Technology Stage  | 2004-2010(Chang, 2010; Jones, Johnson & Bentley, 2004; Hashim & Gapor, 2010; Roberts & Naqvi, 2010) | Wireless Learning Platforms | Focus on technology to generate information to problem solve | Asynchronous learning  | Professor and learner |
|  |  |  |  |  |  |
| 9. Smart Experiential Knowledge Stage | 2010-2015(Jennings & Wargnier, 2010; Larsen, 2004; Tucker & Lee, 2014) | Smart MobileExperiential Learning Platforms | Focus on Action, rather than information | Student MobilityPreparation for unknown organization challenges  | Learner has increased control, professor decreased control |
|  |  |  |  |  |  |
| 10.Time-Space Knowledge Paradigm Stage | Post 2015(Hayman & Smith, 2015; Papastamatis & Panitsides, 2014; Prata, Letouze, Cerri & Costa, 2016; Rowe, 2015; University Business Staff, 2015)  | Mobile smart technology, Game theory,Cloud Systems | New Knowledge Construction integrating cross-industry discipline learningCustomized learning goals; Instantaneous feedback | Holistic ConceptsNew paradigms of Critical Thinking involving spatial temporal awareness concepts “Flexible Critical-Thinking Concept©2015 Perlman | Learner |
|  |  |  |  |  |  |

**Mobile Learning and Educational-Value Pedagogy**

A concise definition of mobile learning is shared by Hwang & Tsai (2011) as “using mobile technologies to facilitate learning” (p. 65). The definition stresses the nature of digital devices enabling users to learn in a diversity of ways that transcends specific places or times. Individuals are free to engage in learning activities whether individual or group oriented in a diversity of settings. Mobile learning definitions vary on their focus with a stress on the personal or individual nature of the interactions with technologies involving information and knowledge sharing. Mobile devices have several advantages over desktop computers such as being easy to carry and can be less expensive. Smart phones have become very popular due to their ability to communicate, share information and photos.

Wen-Hsiung,Yen-Chen, Chun-Yu, Hao-Yun, & Che-Hung (2012) conducted a meta-analysis of 164 articles on mobile learning and the majority of the studies focused on the issue of effectiveness. The research findings identified a pattern of significantly positive educational outcomes. Yet, the literature reflects a lack of consensus about a specific educational theory to support mobile learning. There are writers who advocate a variety of theoretical approaches: activity learning, constructivism and collaborative learning (Friedel, Bos, Lee & Smith, 2013). Constructivism has been a popular theoretical model because it offers the possibility of students developing their own knowledge.

Educators are skeptical about placing unrealistic expectations on higher education students. Muirhead (2006) related “Educators are concerned about students having to teach themselves vital knowledge content areas and whether students are truly understanding basic subject concepts” (p. 17). Therefore, there are questions about the depth of the student’s knowledge and their ability to independently build knowledge with limited teacher guidance. Also, critics have raised questions about the amount of time necessary for students to develop and finish the complex projects. For instance, the greater emphasis on discovery learning creates the need for more time that individuals must explore and discern information before creating knowledge products. Therefore, teachers must evaluate their short and long term learning goals and potential benefits when creating assignments (Tobias, 2009).

It is important to be objective when selecting an educational theory. The literature reveals numerous writers who consistently advocate the constructivism but often fail to acknowledge the theories’ limitations or disadvantages. In a recent study using constructivism principles, undergraduate psychology students practiced complex skills through computer based simulation-based training. Vogel-Walcott, Gebrim, Bowers, Carper & Nicholson (2011, p. 1365) reflected disappointment with this approach, “while contemporary researchers continue to defend the use of constructivist strategies, our research supports earlier findings that question the utility, efficiency, and impact of these strategies in applied domains” (p. 1365).

Educators should examine how to effectively integrate smart technologies into their courses such as noting what other instructors have done. Keskin & Metcalf (2011) shared suggestions for matching technologies with learning objectives and educational theories such as using Cognitive Load Theory by using audio, video and animation. Combing theories can be an effective way to assist students who vary in their cognitive maturity. The Cognitive Apprenticeship Model involves situated learning and constructivism (Sammel,Weir, & Klopper, 2014).

The debate over educational theories will continue but teachers must identify relevant and effective ways to integrate technologies into their instruction. Therefore, the literature points to the need to understand how mobile learning represents a new educational format and is impacting traditional relationship boundaries. Nortcliffe & Middleton (2013) related that “Delineation between study, life and work is fading and the pervasive, persistent nature of smart technology is part of that change” (p. 179). For instance, students will share a course audio or video clip with family members. University educators must recognize when integrating smart technologies into course work will require considering a variety of factors, as follows:

1. Teacher and student expertise with the technologies

2. Evaluation procedures for formal and informal learning situations

3. Degree of teacher directed learning and guidance with technologies

5. Types of technologies to be use

6. Selecting the educational philosophy to best leverage the technologies

7. Learning objectives/simple to complex (e.g. knowledge creation)

8. Ways to individualize and foster personalized learning opportunities

9. Students establishing boundaries between work/school/family/leisure

10. Peer pressures and influences when working in social media environments.

The ten factors reflect how mobile learning is multidimensional and has created new opportunities and challenges. There will be a series of teacher choices when designing an activity: identifying the best match between technologies and an activity and educational theory or theories, developing relevant goals (e.g. subject content/critical thinking) and deciding how to evaluate the student work. Adult learners want intellectually engaging and relevant assignments. Smart technologies have the potential to foster creative opportunities for students to produce original ideas and products. Csikszentmihalyi (1990, 1996) is well known for the theory called the flow and encouraging creativity. It has relevance for educators who want to foster creative learning goals with smart technologies by applying the following guidelines:

1. Create clear objectives and expectations

2. Develop a balance between competencies and skills of individual to foster realistic challenges

3. Provide timely feedback

4. Offer opportunities for significant personal control over learning experiences

5. Promote intrinsic motivation and playful attitudes through the use of enjoyable activities.

The guidelines are based on adapting a learner centered teaching philosophy and by providing appropriate teaching strategies that recognize the developmental level of the student (e.g. scaffolding knowledge). Optimal learning situations will challenge individuals but will not overwhelm them. Ultimately, the best experiences are enjoyable and add value to the individual’s educational journey. Students dislike superficial work but appreciate having meaningful projects. Mobile learning lessons can cultivate reflective and novel thinking and promote lifelong learning attitudes and study habits. In fact, the wise application of technology assignments could promote intrinsic motivation and encourage a deeper form of learning by being absorbed with studying.

Edmundson (2014) observed that “I’d say, rather, that the deep opposite of attention isn’t distraction, but absorption. No one ever tells you ‘pay absorption.’ Absorption is what occurs when you immerse yourself in something you love doing” (p. 30).Teachers can utilize smart technologies to design relevant activities that are personal, positive and foster a desire for acquiring new knowledge and skills.

In summary, educational-value pedagogy is grounded in a creative learner-centered teaching philosophy. Adaptation to this philosophy is facilitated by an understanding of educational-value differentiation among distance learning technologies (Hashim & Gapor, 2010). Adult learner engagement focus can be correlated to effective use of these different technology platforms.

**10-Stage Educational Value-Differentiation Technology Chronology (ETVC) Model**©2015 Perlman

There is a controversy in the field on whether technology is a tool or a product (Hashim & Gapor, 2010). However, whether classified as a tool or product, technology provides a teaching aid which enables educators to engage students in a creative way. The integrated use of technology fosters an educational value-differentiation. In this section, building from the time-line discussion by Hashim & Gapor (2010), a new ten stage chronology model is proposed. Incorporated in the model is a new mapping concept of educational value-differentiation to a chronological technology stage. The new model is discussed below, and is presented in Table 1, 10-Stage Education-Technology Value Chronology (ETVC) Model©2015

The first education-technology value stage is the Visual-Media Stage, approximately 1920-1949. The key characteristic involves use of visual media for education. Prior to this initial technology stage, teaching was done without a “technical” aid. Educators relied primarily on personal presentations and correspondence printed media (Banas & Emory, 1998; Harting & Erthal, 2005). During the 1920s, 1930s, and 1940s; *visual static media* technologies were added to the educational toolbox (Hashim & Gapor, 2010). Examples of visual media included chalk boards, pictures, slides, flash cards, models, and charts.

The second education-technology value stage is the Multi-Media Stage, approximate 1950-1959. During the 1950s, visual media learning was enriched with sound (Hashim & Gapor, 2010). During this era, instructional television was also introduced as a teaching method. As a result, television broadcasting expanded the educational audience. Students in remote areas were now enabled to be part of a class.

The third education-technology value stage is the Information Technology (IT) Process Stage, approximately 1960-1 979. During this stage, more complexity in technological processes enriched instructional delivery of content. With the increased wide-spread use of technology in the 1960s and 1970s, software system processes emerged to facilitate new approaches to teaching (Hashim & Gapor, 2010). Instead of a one-way perspective of the professor presenting information to the student, the student became part of the process. The processes of information systems were integrated as problem solving tools. The student was challenged to solve problems as part of the creative learning process.

Another characteristic of the IT Process Stage was also a change in **who** had the control of the process (Hashim & Gapor, 2010). Prior to 1960, the professor controlled the visual and audio learning aids. Post 1960, learners had an increasing level of control over aspects of the learning process and timing. The learner became empowered to change parameters, situations, etc. to test problem-solving solutions.

The focus of instruction for learners during the IT Process Stage involved a basic 3-part process (Hashim & Gapor, 2010). First, students were required to read a case to determine problem identification. Second, students discussed the analysis of an issue. From their analysis, students used software to develop solutions. This approach to learning enhanced the prior approach of a one-way, visual presentation of a problem. Utilizing this systematic and logical approach to problems enabled adult learners to understand how they might approach situations in the real world. However, learners were still limited by case (i.e. the details given by the professor) parameters.

The fourth education-technology value stage is the Information and Communication Technology Development (ICTD) Application Stage, approximately 1980 through 1989. This stage emerged with the wide-spread use of the internet (Hashim & Gapor, 2010). While the internet began in the 1960s, academic use first began in the 1980s (Internet Society, 2015). With the availability of this technology, academician theorists were able to incorporate the internet as part of the 20th Century educational strategies (Hashim & Gapor, 2010).

During this stage, behavioral learning theory was integrated with ICTD approaches (Hashim & Gapor, 2010). With the advent of mapping behavioral learning strategies to the internet functionality, course designers began new approaches to learning. Instructional designers developed class learning modules with integration of cognitive learning theory concepts. Adult learners were challenged with new ways of approaching learning.

The fifth education-technology value stage is ICTD Integration Stage, approximately 1990-1994. The distinction of this stage was two-fold. First, Internet and personal computer applications integration gained wide-spread availability and use (Reiser, 2001). Second, in response to this new way of working and learning, there was a change in the educational definition of information technology. During this stage, the IT education definition expanded to include both theoretical and practical application within learning processes and resources across five ICT areas: design, development, utilization, management and evaluation (Seels & Richey, 1994).

The sixth education-technology value stage is the Electronic Performance Support Systems (EPSS) Stage, approximately 1995-1999. Introduced in the early part of the 20th Century, EPSS provided instructional design software and hardware to facilitate real-time learning (Lee, 2005). With this technology capability, educators were able to integrate constructive theory principles to online learning (Partlow & Gibbs, 2003). The learning goals became focused on work specific learning. The educational approach involved a *just-in-time* approach (Reiser, 2001). Adult learners gained more control over their learning process and were enabled to learn key information which they could use in their jobs.

The seventh education-technology value stage is the Knowledge Systems Stage, approximately 2000 through 2003. This stage was an outgrowth of the EPSS Stage. From being primarily a technology tool to facilitate learning, EPPS evolved into management of knowledge systems (Gal & Nachmias, 2011; Rowley, 2000). The key differentiating educational added-value was *learning-by-doing.* As a result, increased integration of real-world learning outcomes for students became possible. To achieve this learning goal, educational activities such as tutorials, multiple perspective discussions, and learn-by-doing simulations were incorporated into course content (Driscoll, 2000).

The eighth education-technology value stage is the Instructional Technology, approximately 2004-2010. In this stage, the educational value differentiation focus was on using technology integrated with constructive teaching theory (Knowlton, 2005). Instructional designers matched course activities to targeted technology, rather than vice-versa (Hashim & Gapor, 2010). Also, during this stage, a key online educational platform was through asynchronous delivery via wireless technology, (Chang, 2010; Jones, Johnson & Bentley, 2004).

The ninth education-technology value stage is Smart Experiential-Knowledge Stage, 2011-2015. This stage developed out of an industry need for more flexibility in experiential learning outcomes. In learn-by-doing, students utilized memorization with situational applicability. When a situation arose, learned knowledge could be retrieved and applied (Larsen, 2004).

With the rapid changes in 21st Century organization environments, came the need for a different kind of experiential knowledge. Instead of expected situations, education was needed to prepare people for unknown organization challenges (Jennings & Wargnier, 2010; Tucker & Lee, 2014). A more dynamic type of retained learning was needed. This type of learning could be labeled as a *smart* experiential knowledge. The focus of *smart experiential-knowledge* is on action rather than information. Additionally, the technology platform is increasingly more mobile. A new focus on adult learner outcomes is knowledge of how and where to find applicable solutions.

The tenth education-technology value stage is the Time-Space Knowledge Paradigm Stage, with a timeline designated as “post 2015”. The focus of this education stage is 2-fold. The first aspect involves teaching adult learners how to use emergent new 21st Century technologies to resolve organization issues (Hayman & Smith, 2015). Emergent technologies will enable smaller and more mobile access to users. Game theory is being integrated into education (Prata, Letouze, Cerri, & Costa, 2016).

Emerging technologies are enabling increasingly rapid rates of information retrieval accompanied with increasing rates of robust capabilities. Devices will work together to enable the user to immediate access to current and predicted information across industry disciplines. Accordingly, the primary form of education post 2015 is forecasted to be distance learning (University Business Staff, 2015). Distance learning technology will be customized to the student, with individualized learning goals and objectives, and incorporate instantaneous feedback.

The second aspect involves development of a new kind of critically thinking. One which incorporates flexibility for knowledge which is already known (i.e. known in the present) can be transferred, into what might be known in the future (University Business Staff, 2015). To develop this critical thinking flexibility, new models of knowledge will incorporate a synthesis across different disciplines (Rowe, 2015).

In a 2015 ethnographic study, Rowe found evidence supporting the idea that learning transcends through time and space. Rowe concluded that learning exists “not only located in, but through time-space” (p. 122). This holistic approach is supported by an integrated theory of transformative learning (Papastamatis & Panitsides, 2014). A new concept is proposed for this concept: the *Flexible Critical-Thinking Concept*©jrperlman 2015 Flexibility combined with a spatial temporal awareness is the foundation for this new concept.

**Educational Value Differentiation Reflections: Selective Integration of New Technologies and Intentional Design of Superior Student Learning Experiences**

Ubiquitous learning refers to learning connected through and permeating all direct and indirect areas of our lives; along with electronic delivered education has become pervasive (Ogata, Hui, Yin Ueda, & Yano, 2008). Academic institutions are charged with reexamining their content delivery systems, their targeted audience and their value differentiation of knowledge generated by a managed design (Ogata, Misumi, Matsuka, El-Bishouty & Yano, 2008).

Experiential leaning refers to learning by doing within a crafted learning environment. This has been learning platform for educators and academicians for more than 20 years (Kolb, 2013). This learning approach has maintained credibility among some institutions that are in the process of leveraging technology and providing the mix of tools, content and environmental experiences created to enhance leaning outcomes.

Lewin (1941), Freire (1970) and Piaget (1977) advanced the idea that learning is a function of how we process experience and the meanings derived therein. Kolb, outlined a holistic process relating knowledge transfer with the interpretation of an experience by its constituents (Kolb, 1984). Managing a student’s total experience, which is mediated by technology as a channel of educational delivery, might provide a contemporary vista and plausible method of augmenting the value of the education received and the positioning of the institution in marketplace.

In concert, the application of ubiquitous and pervasive learning platforms along with the introduction of new online and mobile technologies, in a framework of ubiquitous learning, can capture and leverage differentiated learning models. Distilled and properly blended social networking tools, content tracking tools, collaboration tools, productivity software, research organizing software and mobility APPS, can impact the design of communication channels, protocols and environments used by educators (Craig, 1999). Emphasis, however, should not reside in software and applications components alone. Software applications and the academic tools generate opportunity, but the configuration, context, and learning environment constructed by educators and experienced by students are a function of how the components are premeditated.

Currently, the existence of an optimal technological platform may not exist. An absolute learning model and its blueprint or mapping of the mix of technology, content and learning environmental qualities leading to higher order learning outcome are being destabilized. Academic prognosticators and subject matter experts (SMEs) continue to generate new learning delivery configurations. Technology and its variations applied in education might be more of a craft than an academic science (Haskin, 2005). Value is not created through singular or collective software applications unless the software is mediated by its linked applications and benefit and by the perceived continuity of the systems design with student outcomes and experience configuration.

Within the schematic of experiential models, lies the faculty or trainer who has a fiduciary and/or contractual responsibility to elevate learners’ competencies. Faculty and trainers, in the new paradigm can create a learning space that is transparent and inspires open communication and learning. Technological advancements now can make core physical classroom and training environments highly utilitarian to those who learn from a distance. Once, traditional classroom environments provided learning intense and content rich backdrop for learners. Now, the new technological learning platforms and virtual environment have the potential of functioning with equal intensity and effectiveness but through a multitude of experiential lenses. Students can participate in online learning environments while mobile and un-tethered to a physical (traditional classroom) or virtual location (computer based location) that provide an ambiance of rich communication, visual presentations and synchronous knowledge sharing experiences (Ogata, et al., 2008).

Knowledge sharing and transfer can be differentiated in meaning and process and is grounded in the study of philosophy known as epistemology (Crawford, 2004 ), but how one learns explicitly or implicitly, can come from multiple origins including discovery and experience or purposeful engagement, be it in a classroom setting or in a virtual setting. There is evidence that other than the average attrition of information learned by an individual when learning content there is a significant reduction of retention since learners can immediately access the data or information via electronic sources (Dror, 2008)

With immediate access to electronic databases, there has been a shift by learners from personally storing or memorizing data and information from what is introduced to memory to storing less than 10% of what is introduced to memory (Dror, 2008). In part the shift from storing information in one’s personal memory to accessing stored electronic data for use is a growing phenomenon. For example, using a Google search or retrieving data from a institutional research database, or storing and access of Cloud systems (a data utility system) as information repositories has, in part, become the surrogate for personal memory. Such a shift from memory to using technology for immediate information retrieval is a fundament change in the way and opportunities presented that students learn within ubiquitous learning models).

**Table xxx**

Traditional Learning Vs Ubiquitous Learning Experiences

|  |  |  |
| --- | --- | --- |
| Categories | Traditional | Experiential |
| Knowledge | Faculty Driven & Created | Co-created by Faculty & Student |
| Relationships | Impersonal | Personal |
| Student Role  | Passive | Active |
| Faculty Role | Classify Students | Advance Student Competencies |
| Assumptions | Experts Teach | Experts Guide & Work Together with Students |
| Activity Type | Competitive and Empirically Based | Collaborative with Information Sharing |
| Environment | Linear and Controlled by Faculty | Open, Robust, Responsive and Dynamic created by Faculty & Student in dynamic and mobile environment |

On Recommending Web 2.0 Tools to Personalize Learning

[Juskeviciene, Anita](http://search.proquest.com.contentproxy.phoenix.edu/indexinglinkhandler/sng/au/Juskeviciene%2C%2BAnita/%24N?accountid=35812); [Kurilovas, Eugenijus](http://search.proquest.com.contentproxy.phoenix.edu/indexinglinkhandler/sng/au/Kurilovas%2C%2BEugenijus/%24N?accountid=35812" \o "Click to search for more items by this author). (2014) *Information in Education*[*13* (1)](http://search.proquest.com.contentproxy.phoenix.edu/indexingvolumeissuelinkhandler/106037/Informatics%2Bin%2BEducation/02014Y01Y01%24232014%243b%2B%2BVol.%2B13%2B%24281%2429/13/1?accountid=35812) 17-31.

The differences of traditional learning versus technologically ubiquitous learning in combination with technologically mediated learning vary as formal research of the topic and its applications gains momentum. Interest in designing an optimal mix of emerging technologies applications and traditional teaching models has not been cemented in since the process is ongoing and somewhat untested and abductive in reasoning (Paul & Elder, 2009).

Salient and enduring aspect of integrated learning models are subject to rapidly changing technological trends and social communication practices. As technological communicative channels become increasingly mobile and pervasive among student populations, curriculum developers are tasked with new and continually shifting challenges. Large platform ubiquitous learning systems such as Blackboard or Canvas, are charged with stylized component producers of software that allow for mobility and disruptive educational technologies (Anderson & Whitlock, 2004). Importantly consumers of education and their increasing expectation that academic institutions will immediately adjust and adopt burgeoning technological tools that are preferred and trending further changing the landscape of online learning.

**Conclusions and Recommendations**

Wallace and Wray (2011) suggested that there are three concepts in mappingknowledge: 1) theoretical knowledge 2) research knowledge and 3) Practice knowledge. Theoretical knowledge requires the encouragement of change. Research knowledge advances improvements in the field of study. Practice knowledge provides insights based on social interaction and open environments.

The question that germinates from Wallace and Wray’s studies and that requires further investigation is “How do educators translate the tripartite forms of knowledge into value laden learning within burgeoning and inconsistent technological environments?” Providing learning experiences integrated with ubiquitous learning technology may also carry the responsibility of assuring a learning environment that is vibrant, celebratory and enjoyable (RaŃiu & Negricea, 2008). Research is also needed on identification of effective post 2015 ubiquitous learning technologies.

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